

# SEQUENCE LISTING



<110> Han, et al.

<120> HUMAN E3 ALPHA UBIQUITIN LIGASE FAMILY

<130> 01017/35966C

<140> US 10/758,636

<141> 2004-01-15

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<150> US 60/187,911

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<160> 29

<170> PatentIn version 3.2

<210> 1

<211> 6308

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (696)..(5942)

<400> 1

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Ser Val Gln Met Ser Ile Phe Thr Pro Leu Glu Trp Tyr Leu Phe Gly  
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Val Ile Tyr Ser Leu Gln Arg Ala Leu Asp Cys Glu Leu Ala Glu Ala  
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Thr	Cys	Ala	Phe	Thr	Ile	Gln	Ala	Ile	Glu	Asn	Leu	Leu	Gly	Asp
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Ile Tyr Cys Arg Gly Pro Asn Pro Phe Pro Gln Lys Glu Asp Met Leu  
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Ala Gln His Val Leu Leu Gly Pro Met Glu Trp Tyr Leu Cys Gly Glu  
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Asp Pro Ala Phe Gly Phe Pro Lys Leu Glu Gln Ala Asn Lys Pro Ser  
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His Leu Cys Gly Arg Val Phe Lys Val Gly Glu Pro Thr Tyr Ser Cys  
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Arg Asp Cys Ala Val Asp Pro Thr Cys Val Leu Cys Met Glu Cys Phe  
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Leu Gly Ser Ile His Arg Asp His Arg Tyr Arg Met Thr Thr Ser Gly  
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Gly Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Glu Gly  
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Pro Tyr Cys Gln Lys His Glu Leu Asn Thr Ser Glu Ile Glu Glu Glu  
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Glu Asp Pro Leu Val His Leu Ser Glu Asp Val Ile Ala Arg Thr Tyr  
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Asn Ile Phe Ala Ile Thr Phe Arg Tyr Ala Val Glu Ile Leu Thr Trp  
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Glu Lys Glu Ser Glu Leu Pro Ala Asp Leu Glu Met Val Glu Lys Ser  
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Met Leu Cys Ile Met Gly Thr Ile Leu Gln Trp Ala Val Glu His Asn  
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Ala Asn Lys Leu Ile Asp Leu Pro Glu Asp Tyr Ser Ser Leu Ile	
1600 1605 1610	
aac caa gca tcc aat ttc tcg tgc ccc aaa tca ggt ggc gac aag	5643
Asn Gln Ala Ser Asn Phe Ser Cys Pro Lys Ser Gly Gly Asp Lys	
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agc aga gct cct act ctg tgc ctc gtg tgt ggg agt ctc ctc tgc	5688
Ser Arg Ala Pro Thr Leu Cys Leu Val Cys Gly Ser Leu Leu Cys	
1630 1635 1640	
tct cag agt tac tgc tgc caa gct gag ctg gag ggt gag gac gtc	5733
Ser Gln Ser Tyr Cys Cys Gln Ala Glu Leu Glu Gly Glu Asp Val	
1645 1650 1655	
gga gcc tgc aca gca cac acc tac tcc tgc ggc tcc ggg gcc ggc	5778
Gly Ala Cys Thr Ala His Thr Tyr Ser Cys Gly Ser Gly Ala Gly	
1660 1665 1670	
atc ttc ctg aga gtg cgg gaa tgt cag gtg cta ttt tta gct ggc	5823
Ile Phe Leu Arg Val Arg Glu Cys Gln Val Leu Phe Leu Ala Gly	
1675 1680 1685	
aaa acc aaa gga tgt ttt tat tct cct cct tac ctt gac gac tat	5868
Lys Thr Lys Gly Cys Phe Tyr Ser Pro Pro Tyr Leu Asp Asp Tyr	
1690 1695 1700	
gga gag acc gac cag gga ctc aga cga gga aat cct tta cat tta	5913
Gly Glu Thr Asp Gln Gly Leu Arg Arg Gly Asn Pro Leu His Leu	
1705 1710 1715	

tgc caa gag cgg	ttt cga aag atc cag	aag ctc tgg cag cag	cat	5958
Cys Gln Glu Arg	Phe Arg Lys Ile Gln	Lys Leu Trp Gln Gln	His	
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agt atc aca gag	gag atc gga cac gcg	cag gag gct aac cag	acc	6003
Ser Ile Thr Glu	Glu Ile Gly His Ala	Gln Glu Ala Asn Gln	Thr	
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ctg gtc gga att	gac tgg cag cat tta	taatcgctcc tctactaaaa	6050
Leu Val Gly Ile	Asp Trp Gln His Leu		
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35 40 45

Ile Tyr Cys Arg Gly Pro Asn Pro Phe Pro Gln Lys Glu Asp Thr Leu
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Ala Gln His Ile Leu Leu Gly Pro Met Glu Trp Tyr Ile Cys Ala Glu
65 70 75 80

Asp Pro Ala Leu Gly Phe Pro Lys Leu Glu Gln Ala Asn Lys Pro Ser
85 90 95

His Leu Cys Gly Arg Val Phe Lys Val Gly Glu Pro Thr Tyr Ser Cys
100 105 110

Arg Asp Cys Ala Val Asp Pro Thr Cys Val Leu Cys Met Glu Cys Phe
115 120 125

Leu Gly Ser Ile His Arg Asp His Arg Tyr Arg Met Thr Thr Ser Gly
130 135 140

Gly Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Glu Gly
145 150 155 160

Pro Tyr Cys Gln Lys His Lys Leu Ser Ser Ser Glu Val Val Glu Glu  
 165 170 175

Glu Asp Pro Leu Val His Leu Ser Glu Asp Val Ile Ala Arg Thr Tyr  
 180 185 190

Asn Ile Phe Ala Ile Met Phe Arg Tyr Ala Val Asp Ile Leu Thr Trp  
 195 200 205

Glu Lys Glu Ser Glu Leu Pro Glu Asp Leu Glu Val Ala Glu Lys Ser  
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Asp Thr Tyr Tyr Cys Met Leu Phe Asn Asp Glu Val His Thr Tyr Glu  
 225 230 235 240

Gln Val Ile Tyr Thr Leu Gln Lys Ala Val Asn Cys Thr Gln Lys Glu  
 245 250 255

Ala Ile Gly Phe Ala Thr Thr Val Asp Arg Asp Gly Arg Arg Pro Val  
 260 265 270

Arg Tyr Gly Asp Phe Gln Tyr Cys Asp Gln Ala Lys Thr Val Ile Val  
 275 280 285

Arg Asn Thr Ser Arg Gln Thr Lys Pro Leu Lys Val Gln Val Met His  
 290 295 300

Ser Ser Val Ala Ala His Gln Asn Phe Gly Leu Lys Ala Leu Ser Trp  
 305 310 315 320

Leu Gly Ser Val Ile Gly Tyr Ser Asp Gly Leu Arg Arg Ile Leu Cys  
 325 330 335

Gln Val Gly Leu Gln Glu Gly Pro Asp Gly Glu Asn Ser Ser Leu Val  
 340 345 350

Asp Arg Leu Met Leu Asn Asp Ser Lys Leu Trp Lys Gly Ala Arg Ser  
 355 360 365

Val Tyr His Gln Leu Phe Met Ser Ser Leu Leu Met Asp Leu Lys Tyr  
 370 375 380

Lys Lys Leu Phe Ala Leu Arg Phe Ala Lys Asn Tyr Arg Gln Leu Gln  
 385 390 395 400

Arg Asp Phe Met Glu Asp Asp His Glu Arg Ala Val Ser Val Thr Ala  
 405 410 415



Leu Ser Val Gln Phe Phe Thr Ala Pro Thr Leu Ala Arg Met Leu Leu  
 420 425 430

Thr Glu Glu Asn Leu Met Thr Val Ile Ile Lys Ala Phe Met Asp His  
 435 440 445

Leu Lys His Arg Asp Ala Gln Gly Arg Phe Gln Phe Glu Arg Tyr Thr  
 450 455 460

Ala Leu Gln Ala Phe Lys Phe Arg Arg Val Gln Ser Leu Ile Leu Asp  
 465 470 475 480

Leu Lys Tyr Val Leu Ile Ser Lys Pro Thr Glu Trp Ser Asp Glu Leu  
 485 490 495

Arg Gln Lys Phe Leu Gln Gly Phe Asp Ala Phe Leu Glu Leu Leu Lys  
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Cys Met Gln Gly Met Asp Pro Ile Thr Arg Gln Val Gly Gln His Ile  
 515 520 525

Glu Met Glu Pro Glu Trp Glu Ala Ala Phe Thr Leu Gln Met Lys Leu  
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Thr His Val Ile Ser Met Val Gln Asp Trp Cys Ala Leu Asp Glu Lys  
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Val Leu Ile Glu Ala Tyr Lys Lys Cys Leu Ala Val Leu Thr Gln Cys  
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His Gly Gly Phe Thr Asp Gly Glu Gln Pro Ile Thr Leu Ser Ile Cys  
 580 585 590

Gly His Ser Val Glu Thr Ile Arg Tyr Cys Val Ser Gln Glu Lys Val  
 595 600 605

Ser Ile His Leu Pro Ile Ser Arg Leu Leu Ala Gly Leu His Val Leu  
 610 615 620

Leu Ser Lys Ser Glu Val Ala Tyr Lys Phe Pro Glu Leu Leu Pro Leu  
 625 630 635 640

Ser Glu Leu Ser Pro Pro Met Leu Ile Glu His Pro Leu Arg Cys Leu  
 645 650 655

Val Leu Cys Ala Gln Val His Ala Gly Met Trp Arg Arg Asn Gly Phe  
 660 665 670

Ser Leu Val Asn Gln Ile Tyr Tyr Tyr His Asn Val Lys Cys Arg Arg  
 675 680 685

Glu Met Phe Asp Lys Asp Ile Val Met Leu Gln Thr Gly Val Ser Met  
 690 695 700

Met Asp Pro Asn His Phe Leu Met Ile Met Leu Ser Arg Phe Glu Leu  
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Tyr Gln Leu Phe Ser Thr Pro Asp Tyr Gly Lys Arg Phe Ser Ser Glu  
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Val Thr His Lys Asp Val Val Gln Gln Asn Asn Thr Leu Ile Glu Glu  
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Met Leu Tyr Leu Ile Ile Met Leu Val Gly Glu Arg Phe Asn Pro Gly  
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Val Gly Gln Val Ala Ala Thr Asp Glu Ile Lys Arg Glu Ile Ile His  
 770 775 780

Gln Leu Ser Ile Lys Pro Met Ala His Ser Glu Leu Val Lys Ser Leu  
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Pro Glu Asp Glu Asn Lys Glu Thr Gly Met Glu Ser Val Ile Glu Ser  
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Val Ala His Phe Lys Lys Pro Gly Leu Thr Gly Arg Gly Met Tyr Glu  
 820 825 830

Leu Lys Pro Glu Cys Ala Lys Glu Phe Asn Leu Tyr Phe Tyr His Phe  
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Ser Arg Ala Glu Gln Ser Lys Ala Glu Glu Ala Gln Arg Lys Leu Lys  
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Arg Glu Asn Lys Glu Asp Thr Ala Leu Pro Pro Pro Ala Leu Pro Pro  
 865 870 875 880

Phe Cys Pro Leu Phe Ala Ser Leu Val Asn Ile Leu Gln Cys Asp Val  
 885 890 895

Met Leu Tyr Ile Met Gly Thr Ile Leu Gln Trp Ala Val Glu His His  
 900 905 910

Gly Ser Ala Trp Ser Glu Ser Met Leu Gln Arg Val Leu His Leu Ile  
 915 920 925

Gly Met Ala Leu Gln Glu Glu Lys His His Leu Glu Asn Ala Val Glu  
 930 935 940

Gly His Val Gln Thr Phe Thr Phe Thr Gln Lys Ile Ser Lys Pro Gly  
 945 950 955 960

Asp Ala Pro His Asn Ser Pro Ser Ile Leu Ala Met Leu Glu Thr Leu  
 965 970 975

Gln Asn Ala Pro Ser Leu Glu Ala His Lys Asp Met Ile Arg Trp Leu  
 980 985 990

Leu Lys Met Phe Asn Ala Ile Lys Lys Ile Arg Glu Cys Ser Ser Ser  
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Ser Pro Val Ala Glu Ala Glu Gly Thr Ile Met Glu Glu Ser Ser  
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Arg Asp Lys Asp Lys Ala Glu Arg Lys Arg Lys Ala Glu Ile Ala  
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Arg Leu Arg Arg Glu Lys Ile Met Ala Gln Met Ser Glu Met Gln  
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Arg His Phe Ile Asp Glu Asn Lys Glu Leu Phe Gln Gln Thr Leu  
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Glu Leu Asp Thr Ser Ala Ser Ala Thr Leu Asp Ser Ser Pro Pro  
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Val Ser Asp Ala Ala Leu Thr Ala Leu Gly Pro Ala Gln Thr Gln  
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Val Pro Glu Pro Arg Gln Phe Val Thr Cys Ile Leu Cys Gln Glu  
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Glu Gln Glu Val Thr Val Gly Ser Arg Ala Met Val Leu Ala Ala  
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Phe Val Gln Arg Ser Thr Val Leu Ser Lys Asp Arg Thr Lys Thr  
 1130 1135 1140

Ile Ala Asp Pro Glu Lys Tyr Asp Pro Leu Phe Met His Pro Asp  
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Leu Ser Cys Gly Thr His Thr Gly Ser Cys Gly His Val Met His  
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Gln	Arg	Arg	Gln	Gln	Arg	Leu	Arg	Leu	His	Thr	Ser	Tyr	Asp	Val
1190						1195					1200			
Glu	Asn	Gly	Glu	Phe	Leu	Cys	Pro	Leu	Cys	Glu	Cys	Leu	Ser	Asn
1205						1210					1215			
Thr	Val	Ile	Pro	Leu	Leu	Leu	Pro	Pro	Arg	Ser	Ile	Leu	Ser	Arg
1220						1225					1230			
Arg	Leu	Asn	Phe	Ser	Asp	Gln	Pro	Asp	Leu	Ala	Gln	Trp	Thr	Arg
1235						1240					1245			
Ala	Val	Thr	Gln	Gln	Ile	Lys	Val	Val	Gln	Met	Leu	Arg	Arg	Lys
1250						1255					1260			
His	Asn	Ala	Ala	Asp	Thr	Ser	Ser	Ser	Glu	Asp	Thr	Glu	Ala	Met
1265						1270					1275			
Asn	Ile	Ile	Pro	Ile	Pro	Glu	Gly	Phe	Arg	Pro	Asp	Phe	Tyr	Pro
1280						1285					1290			
Arg	Asn	Pro	Tyr	Ser	Asp	Ser	Ile	Lys	Glu	Met	Leu	Thr	Thr	Phe
1295						1300					1305			
Gly	Thr	Ala	Ala	Tyr	Lys	Val	Gly	Leu	Lys	Val	His	Pro	Asn	Glu
1310						1315					1320			
Gly	Asp	Pro	Arg	Val	Pro	Ile	Leu	Cys	Trp	Gly	Thr	Cys	Ala	Tyr
1325						1330					1335			
Thr	Ile	Gln	Ser	Ile	Glu	Arg	Ile	Leu	Ser	Asp	Glu	Glu	Lys	Pro
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Val	Phe	Gly	Pro	Leu	Pro	Cys	Arg	Leu	Asp	Asp	Cys	Leu	Arg	Ser
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Leu	Thr	Arg	Phe	Ala	Ala	Ala	His	Trp	Thr	Val	Ala	Leu	Leu	Pro
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Val	Val	Gln	Gly	His	Phe	Cys	Lys	Leu	Phe	Ala	Ser	Leu	Val	Pro
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Ser	Asp	Ser	Tyr	Glu	Asp	Leu	Pro	Cys	Ile	Leu	Asp	Ile	Asp	Met
1400						1405					1410			

Phe	His	Leu	Leu	Val	Gly	Leu	Val	Leu	Ala	Phe	Pro	Ala	Leu	Gln
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Cys	Gln	Asp	Phe	Ser	Gly	Ser	Ser	Leu	Ala	Thr	Gly	Asp	Leu	His
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Ile	Phe	His	Leu	Val	Thr	Met	Ala	His	Ile	Val	Gln	Ile	Leu	Leu
1445						1450					1455			
Thr	Ser	Cys	Thr	Glu	Glu	Asn	Gly	Met	Asp	Gln	Glu	Asn	Pro	Thr
1460						1465					1470			
Gly	Glu	Glu	Glu	Leu	Ala	Ile	Leu	Ser	Leu	His	Lys	Thr	Leu	His
1475						1480					1485			
Gln	Tyr	Thr	Gly	Ser	Ala	Leu	Lys	Glu	Ala	Pro	Ser	Gly	Trp	His
1490						1495					1500			
Leu	Trp	Arg	Ser	Val	Arg	Ala	Ala	Ile	Met	Pro	Phe	Leu	Lys	Cys
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Ser	Ala	Leu	Phe	Phe	His	Tyr	Leu	Asn	Gly	Val	Pro	Ala	Pro	Pro
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Asp	Leu	Gln	Val	Ser	Gly	Thr	Ser	His	Phe	Glu	His	Leu	Cys	Asn
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Tyr	Leu	Ser	Leu	Pro	Thr	Asn	Leu	Ile	His	Leu	Phe	Gln	Glu	Asn
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Ser	Asp	Ile	Met	Asn	Ser	Leu	Ile	Glu	Ser	Trp	Cys	Gln	Asn	Ser
1565						1570					1575			
Glu	Val	Lys	Arg	Tyr	Leu	Asn	Gly	Glu	Arg	Gly	Ala	Ile	Ser	Tyr
1580						1585					1590			
Pro	Arg	Gly	Ala	Asn	Lys	Leu	Ile	Asp	Leu	Pro	Glu	Asp	Tyr	Ser
1595						1600					1605			
Ser	Leu	Ile	Asn	Gln	Ala	Ser	Asn	Phe	Ser	Cys	Pro	Lys	Ser	Gly
1610						1615					1620			
Gly	Asp	Lys	Ser	Arg	Ala	Pro	Thr	Leu	Cys	Leu	Val	Cys	Gly	Ser
1625						1630					1635			
Leu	Leu	Cys	Ser	Gln	Ser	Tyr	Cys	Cys	Gln	Ala	Glu	Leu	Glu	Gly
1640						1645					1650			

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Gly Ala Gly Ile Phe Leu Arg Val Arg Glu Cys Gln Val Leu Phe  
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Leu Ala Gly Lys Thr Lys Gly Cys Phe Tyr Ser Pro Pro Tyr Leu  
1685 1690 1695

Asp Asp Tyr Gly Glu Thr Asp Gln Gly Leu Arg Arg Gly Asn Pro  
1700 1705 1710

Leu His Leu Cys Gln Glu Arg Phe Arg Lys Ile Gln Lys Leu Trp  
1715 1720 1725

Gln Gln His Ser Ile Thr Glu Glu Ile Gly His Ala Gln Glu Ala  
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Asn Gln Thr Leu Val Gly Ile Asp Trp Gln His Leu  
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35 40 45

Glu Ile Tyr Phe Ala Glu Met Asp Pro Asp Leu Glu Lys Gln Glu Glu  
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Ser Val Gln Met Ser Ile Leu Thr Pro Leu Glu Trp Tyr Leu Phe Gly  
65 70 75 80

Glu Asp Pro Asp Ile Cys Leu Glu Lys Leu Lys His Ser Gly Ala Phe  
85 90 95

Gln Leu Cys Gly Lys Val Phe Lys Ser Gly Glu Thr Thr Tyr Ser Cys  
100 105 110

Arg Asp Cys Ala Ile Asp Pro Thr Cys Val Leu Cys Met Asp Cys Phe  
115 120 125

Gln Ser Ser Val His Lys Asn His Arg Tyr Lys Met His Thr Ser Thr  
130 135 140

Gly Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Thr Gly  
145 150 155 160

Pro Phe Cys Val Asp His Glu Pro Gly Arg Ala Gly Thr Thr Lys Glu  
165 170 175

Ser Leu His Cys Pro Leu Asn Glu Glu Val Ile Ala Gln Ala Arg Arg  
180 185 190

Ile Phe Pro Ser Val Ile Lys Tyr Ile Val Glu Met Thr Ile Trp Glu  
195 200 205

Glu Glu Lys Glu Leu Pro Pro Glu Leu Gln Ile Arg Glu Lys Asn Glu  
210 215 220

Arg Tyr Tyr Cys Val Leu Phe Asn Asp Glu His His Ser Tyr Asp His



225		230		235		240
Val Ile Tyr Ser	Leu Gln Arg Ala Leu Asp Cys Glu Leu Ala Glu Ala					
	245		250		255	
Gln Leu His Thr Thr Ala Ile Asp Lys Glu Gly Arg Arg Ala Val Lys						
	260		265		270	
Ala Gly Val Tyr Ala Thr Cys Gln Glu Ala Lys Glu Asp Ile Lys Ser						
	275		280		285	
His Ser Glu Asn Val Ser Gln His Pro Leu His Val Glu Val Leu His						
	290		295		300	
Ser Val Val Met Ala His Gln Lys Phe Ala Leu Arg Leu Gly Ser Trp						
	305		310		315	
Met Asn Lys Ile Met Ser Tyr Ser Ser Asp Phe Arg Gln Ile Phe Cys						
	325		330		335	
Gln Ala Cys Leu Val Glu Glu Pro Gly Ser Glu Asn Pro Cys Leu Ile						
	340		345		350	
Ser Arg Leu Met Leu Trp Asp Ala Lys Leu Tyr Lys Gly Ala Arg Lys						
	355		360		365	
Ile Leu His Glu Leu Ile Phe Ser Ser Phe Phe Met Glu Met Glu Tyr						
	370		375		380	
Lys Lys Leu Phe Ala Met Glu Phe Val Lys Tyr Tyr Lys Gln Leu Gln						
	385		390		395	
Lys Glu Tyr Ile Ser Asp Asp His Glu Arg Ser Ile Ser Ile Thr Ala						
	405		410		415	
Leu Ser Val Gln Met Leu Thr Val Pro Thr Leu Ala Arg His Leu Ile						
	420		425		430	
Glu Glu Gln Asn Val Ile Ser Val Ile Thr Glu Thr Leu Leu Glu Val						
	435		440		445	
Leu Pro Glu Tyr Leu Asp Arg Asn Asn Lys Phe Asn Phe Gln Gly Tyr						
	450		455		460	
Ser Gln Asp Lys Leu Gly Arg Val Tyr Ala Val Ile Cys Asp Leu Lys						
	465		470		475	
					480	

Tyr Ile Leu Ile Ser Lys Pro Val Ile Trp Thr Glu Arg Leu Arg Ala  
                     485                    490                    495

Gln Phe Leu Glu Gly Phe Arg Ser Phe Leu Lys Ile Leu Thr Cys Met  
                     500                    505                    510

Gln Gly Met Glu Glu Ile Arg Arg Gln Val Gly Gln His Ile Glu Val  
                     515                    520                    525

Asp Pro Asp Trp Glu Ala Ala Ile Ala Ile Gln Met Gln Leu Lys Asn  
                     530                    535                    540

Ile Leu Leu Met Phe Gln Glu Trp Cys Ala Cys Asp Glu Asp Leu Leu  
 545                    550                    555                    560

Leu Val Ala Tyr Lys Glu Cys His Lys Ala Val Met Arg Cys Ser Thr  
                     565                    570                    575

Asn Phe Met Ser Ser Thr Lys Thr Val Val Gln Leu Cys Gly His Ser  
                     580                    585                    590

Leu Glu Thr Lys Ser Tyr Lys Val Ser Glu Asp Leu Val Ser Ile His  
                     595                    600                    605

Leu Pro Leu Ser Arg Thr Leu Ala Gly Leu His Val Arg Leu Ser Arg  
                     610                    615                    620

Leu Gly Ala Ile Ser Arg Leu His Glu Phe Val Pro Phe Asp Ser Phe  
 625                    630                    635                    640

Gln Val Glu Val Leu Val Glu Tyr Pro Leu Arg Cys Leu Val Leu Val  
                     645                    650                    655

Ala Gln Val Val Ala Glu Met Trp Arg Arg Asn Gly Leu Ser Leu Ile  
                     660                    665                    670

Ser Gln Val Phe Tyr Tyr Gln Asp Val Lys Cys Arg Glu Glu Met Tyr  
                     675                    680                    685

Asp Lys Asp Ile Ile Met Leu Gln Ile Gly Ala Ser Ile Met Asp Pro  
                     690                    695                    700

Asn Lys Phe Leu Leu Leu Val Leu Gln Arg Tyr Glu Leu Thr Asp Ala  
 705                    710                    715                    720

Phe Asn Lys Thr Ile Ser Thr Lys Asp Gln Asp Leu Ile Lys Gln Tyr  
                     725                    730                    735

Asn Thr Leu Ile Glu Glu Met Leu Gln Val Leu Ile Tyr Ile Val Gly  
 740 745 750

Glu Arg Tyr Val Pro Gly Val Gly Asn Val Thr Arg Glu Glu Val Ile  
 755 760 765

Met Arg Glu Ile Thr His Leu Leu Cys Ile Glu Pro Met Pro His Ser  
 770 775 780

Ala Ile Ala Arg Asn Leu Pro Glu Asn Glu Asn Asn Glu Thr Gly Leu  
 785 790 795 800

Glu Asn Val Ile Asn Lys Val Ala Thr Phe Lys Lys Pro Gly Val Ser  
 805 810 815

Gly His Gly Val Tyr Glu Leu Lys Asp Glu Ser Leu Lys Asp Phe Asn  
 820 825 830

Met Tyr Phe Tyr His Tyr Ser Lys Thr Gln His Ser Lys Ala Glu His  
 835 840 845

Met Gln Lys Lys Arg Arg Lys Gln Glu Asn Lys Asp Glu Ala Leu Pro  
 850 855 860

Pro Pro Pro Pro Pro Glu Phe Cys Pro Ala Phe Ser Lys Val Val Asn  
 865 870 875 880

Leu Leu Ser Cys Asp Val Met Ile Tyr Ile Leu Arg Thr Ile Phe Glu  
 885 890 895

Arg Ala Val Asp Thr Glu Ser Asn Leu Trp Thr Glu Gly Met Leu Gln  
 900 905 910

Met Ala Phe His Ile Leu Ala Leu Gly Leu Leu Glu Glu Lys Gln Gln  
 915 920 925

Leu Gln Lys Ala Pro Glu Glu Glu Val Ala Phe Asp Phe Tyr His Lys  
 930 935 940

Ala Ser Arg Leu Gly Ser Ser Ala Met Asn Ala Gln Asn Ile Gln Met  
 945 950 955 960

Leu Leu Glu Arg Leu Lys Gly Ile Pro Gln Leu Glu Gly Gln Lys Asp  
 965 970 975

Met Ile Thr Trp Ile Leu Gln Met Phe Asp Thr Val Lys Arg Leu Arg  
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Glu Lys Ser Cys Leu Val Val Ala Thr Thr Ser Gly Leu Glu Cys Ile  
 995 1000 1005

Lys Ser Glu Glu Ile Thr His Asp Lys Glu Lys Ala Glu Arg Lys  
 1010 1015 1020

Arg Lys Ala Glu Ala Ala Arg Leu His Arg Gln Lys Ile Met Ala  
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Gln Met Ser Ala Leu Gln Lys Asn Phe Ile Glu Thr His Lys Leu  
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Met Tyr Asp Asn Thr Ser Glu Val Thr Gly Lys Glu Asp Ser Ile  
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Met Glu Glu Glu Ser Thr Ser Ala Val Ser Glu Ala Ser Arg Ile  
 1070 1075 1080

Ala Leu Gly Pro Lys Arg Gly Pro Ala Val Thr Glu Lys Glu Val  
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Leu Thr Cys Ile Leu Cys Gln Glu Glu Gln Glu Val Lys Leu Glu  
 1100 1105 1110

Asn Asn Ala Met Val Leu Ser Ala Cys Val Gln Lys Ser Thr Ala  
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Leu Thr Gln His Arg Gly Lys Pro Val Asp His Leu Gly Glu Thr  
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Leu Asp Pro Leu Phe Met Asp Pro Asp Leu Ala His Gly Thr Tyr  
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Thr Gly Ser Cys Gly His Val Met His Ala Val Cys Trp Gln Lys  
 1160 1165 1170

Tyr Phe Glu Ala Val Gln Leu Ser Ser Gln Gln Arg Ile His Val  
 1175 1180 1185

Asp Leu Phe Asp Leu Glu Ser Gly Glu Tyr Leu Cys Pro Leu Cys  
 1190 1195 1200

Lys Ser Leu Cys Asn Thr Val Ile Pro Ile Ile Pro Leu Gln Pro  
 1205 1210 1215

Gln Lys Ile Asn Ser Glu Asn Ala Glu Ala Leu Ala Gln Leu Leu  
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Tyr	Asn	Ile	Lys	His	Ala	Lys	Gly	Glu	Ala	Pro	Ala	Val	Pro	Val
1250						1255					1260			
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Glu Lys Gln Glu Glu Ser Val Gln Met Ser Ile Phe Thr Pro Leu Glu  
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Trp Tyr Leu Phe Gly Glu Asp Pro Asp Ile Cys Leu Glu Lys Leu Lys  
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His Ser Gly Ala Phe Gln Leu Cys Gly Arg Val Phe Lys Ser Gly Glu  
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Thr Thr Tyr Ser Cys Arg Asp Cys Ala Ile Asp Pro Thr Cys Val Leu  
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Ala Trp Lys Thr Gly Pro Phe Cys Val Asn His Glu Pro Gly Arg Ala  
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Val Gln Ala Arg Lys Ile Phe Pro Ser Val Ile Lys Tyr Val Val Glu  
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Arg Glu Lys Asn Glu Arg Tyr Tyr Cys Val Leu Phe Asn Asp Glu His  
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Glu Leu Ala Glu Ala Gln Leu His Thr Thr Ala Ile Asp Lys Glu Gly  
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Val Glu Val Leu His Ser Glu Ile Met Ala His Gln Lys Phe Ala Leu  
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Lys Gly Ala Arg Lys Ile Leu His Glu Leu Ile Phe Ser Ser Phe Phe  
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Tyr Lys Gln Leu Gln Lys Glu Tyr Ile Ser Asp Asp His Asp Arg Ser  
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Ile Ser Ile Thr Ala Leu Ser Val Gln Met Phe Thr Val Pro Thr Leu  
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Gly Cys Ala Tyr Pro Ala Pro Tyr Leu Asp Glu Tyr Gly Glu Thr  
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Arg Tyr Arg Lys Leu His Leu Val Trp Gln Gln His Cys Ile Ile  
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